

## Graph Quadratics Using the X-Intercepts

Name: \_\_\_\_\_

**Recall:** In factored form  $y = a(x - r)(x - s)$   $(r, 0)$  and  $(s, 0)$  give the x-intercepts.

To graph  $y = ax^2 + bx + c$  follow the steps:

1. Factor  $y = ax^2 + bx + c$  into  $y = a(x - r)(x - s)$ . Graph the x-intercepts.  $(r, 0)$  and  $(s, 0)$
2. Find the midpoint of  $r$  and  $s$  by using  $\frac{r + s}{2}$ . This gives the axis of symmetry and the  $x$  value of the vertex. Substitute this  $x$  value back into the original relation  $y = ax^2 + bx + c$  to get the  $y$  value of the vertex.
3. Find the  $y$ -intercept by subbing  $x=0$  into  $y = ax^2 + bx + c$ . The  $y$ -intercept is " $c$ ".

**EX:** Sketch the graph of  $y = x^2 + x - 2$  by finding the x-intercepts, y-intercept, and vertex.

**EX:** Sketch the graph of  $y = 3x^2 - 11x - 4$  by finding the x-intercepts, y-intercept and vertex.

**EX:** Write an equation to represent the parabola with x-intercepts  $(-5, 0)$  and  $(3, 0)$  with a vertex of  $(-1, 8)$ .